5. Shoreline Information

5.1. Shoreline Types and Sensitivity

The type of shoreline, degree of exposure to waves and currents, and biological sensitivity are the main criteria for selecting appropriate treatment techniques. Each shoreline type has particular properties (including vegetation types) which facilitate or resist the penetration and persistence of oil. Areas of comparatively uniform sediment type and grain size experience a deeper penetration of oil. Grain size definitions are:

Mud	<0.0625 mm
Fine Sand	0.0625 - 2 mm
Medium to Coarse Sand	2 - 4 mm
Pebble/Cobble	4 - 256 mm

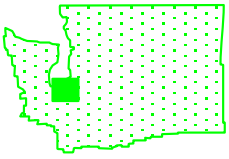
Persistence of oil in a particular area is directly related to the intensity of wave action, tides, and currents. Based on numerous oil spill studies of shoreline characteristics, treatment, and oil impact, the matrices in Chapter 5 were formulated following the basic prototype of the Environmental Sensitivity Index Atlas.

The environmental sensitivity index (ESI) system ranks coastal environments on a scale of 1-10 or 11 (less sensitive to more sensitive) with respect to oil spill sensitivity and potential biological injury. ESI is being used for mapping extensive areas of the coastline of the U.S. Generally speaking, areas exposed to high levels of physical energy, such as wave action and tidal currents, rank low on the scale while sheltered areas have the highest ranking. The shoreline types used in this manual are a combination of the two similar systems used for the Delaware/Pennsylvania/New Jersey ESI Atlas, and the Maryland and Virginia atlases. The numbering system for the Countermeasure Manual Shoreline Types does not correspond exactly to either atlas; however, the corresponding shoreline types can be identified easily from the ESI maps and reassigned the appropriate number (after field verification.) The shoreline ranking system provides a useful first step in the design of contingency plans because it identifies the priority areas that require maximum effort for protection and cleanup. Strike teams and contractors with this document can focus their activities on environmental priorities, particularly during the first few hours and days of the spill.[8]

[8]Regional Response Team III. Draft, *Shoreline Countermeasures Manual*. (Department of the Interior, March 22,1991).

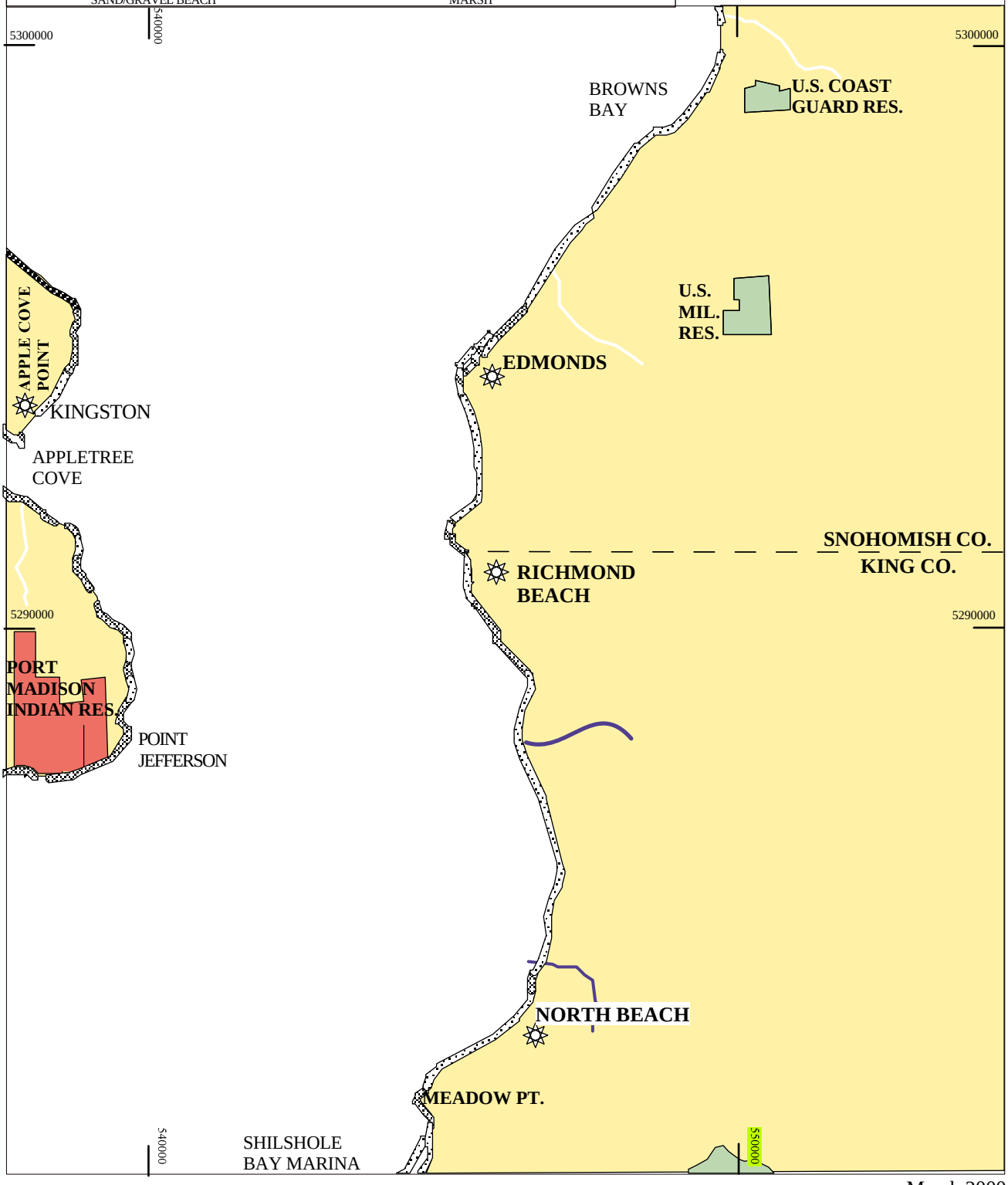
5.2. Shoreline Type Maps

EDMONDS SHORELINE TYPES



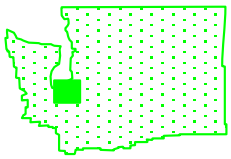
EXPOSED ROCKY SHORE (OR SEAWALL)
WAVE-CUT PLATFORM
FINE GRAINED BEACH
COARSE GRAINED BEACH
SAND/GRAVEL BEACH
GRAVEL/COBBLE/RIPRAP BEACH
EXPOSED TIDAL FLAT
SHELTERED ROCKY FLAT
SHELTERED TIDAL FLAT
MARSH

2500 meters 5000 meters
8200 feet 16400 feet
1 inch equals 2500 meters



PORT MADISON SHORELINE TYPES

CENTRAL PUGET SOUND GRP

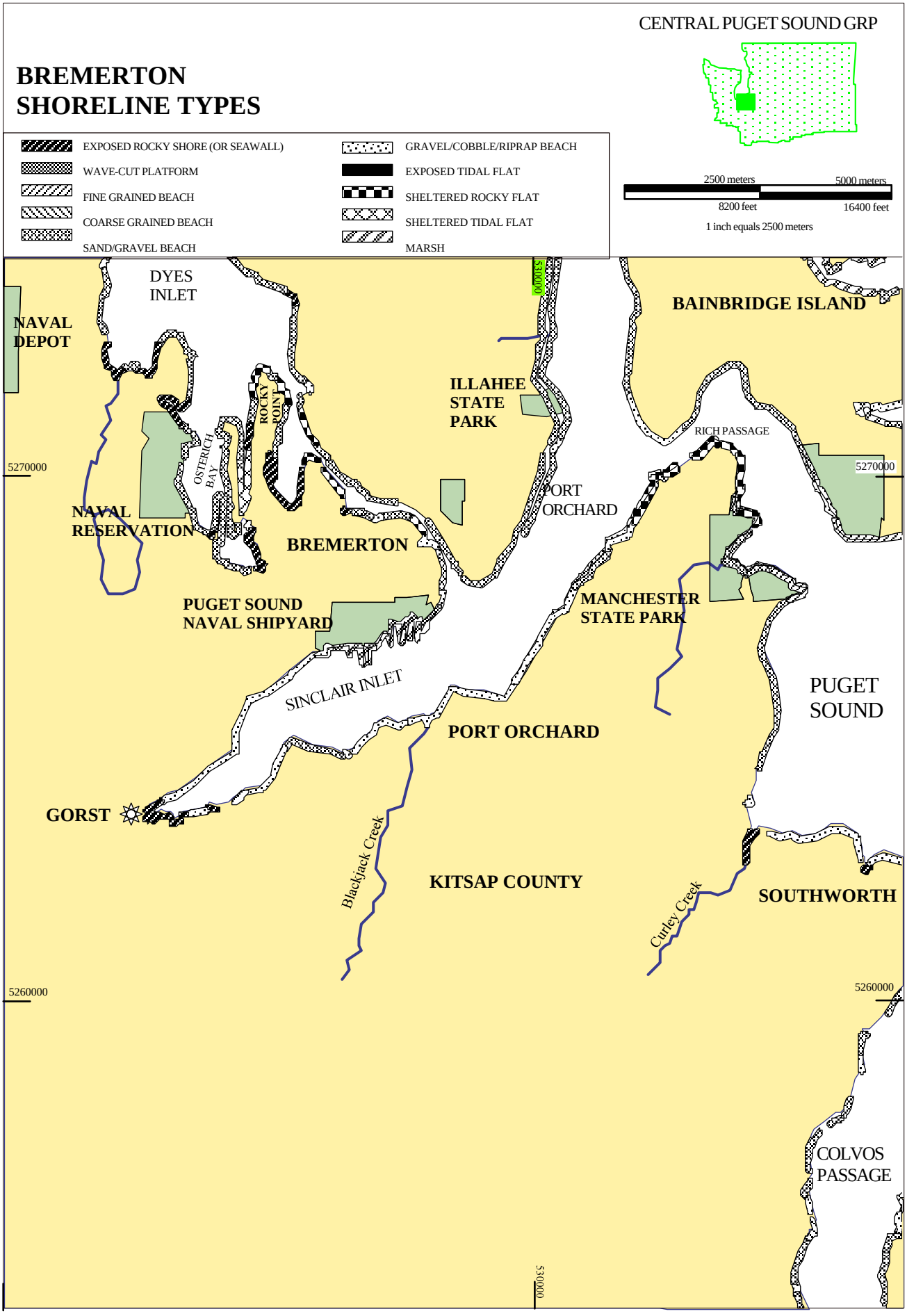


EXPOSED ROCKY SHORE (OR SEAWALL)
WAVE-CUT PLATFORM
FINE GRAINED BEACH
COARSE GRAINED BEACH
SAND/GRAVEL BEACH
GRAVEL/COBBLE/RIPRAP BEACH
EXPOSED TIDAL FLAT
SHELTERED ROCKY FLAT
SHELTERED TIDAL FLAT
MARSH

2500 meters 5000 meters
8200 feet 16400 feet
1 inch equals 2500 meters

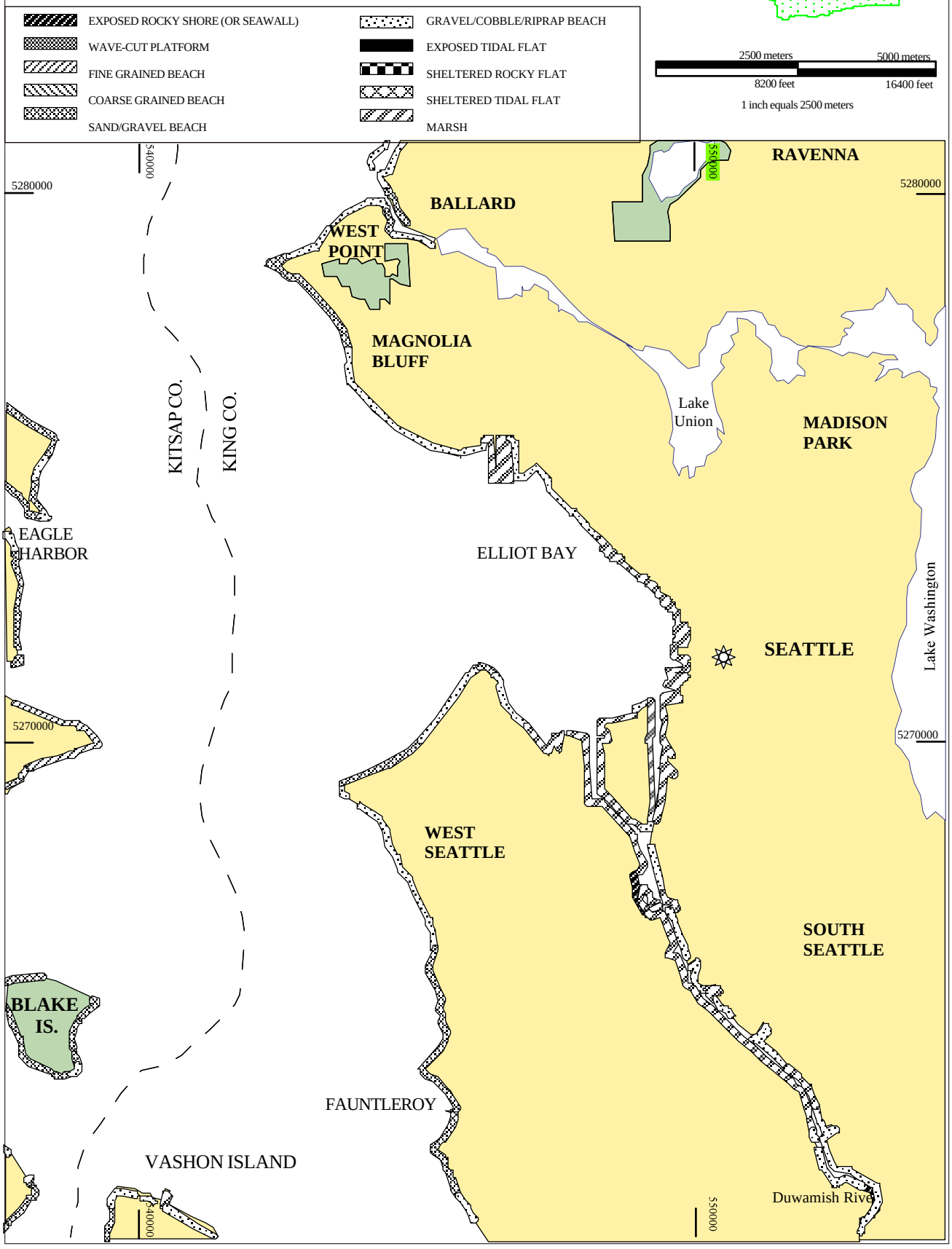
530000
KITSAP COUNTY
VINLAND
5290000
PORT MADISON INDIAN RESERVATION
5290000
INDIANOLA
PORT MADISON INDIAN RESERVATION
POULSBO
U.S. NAVAL RESERVATION.
PORT MADISON
LIBERTY BAY
AGATE PASS
POINT BOLIN
U.S. NAVAL RES.
PORT MADISON
5280000
5280000
Baker Creek
BARKER CREEK
PORT ORCHARD
ARROW POINT
BAINBRIDGE ISLAND
BROWNSVILLE
Crouch Creek
SILVERDALE
DYES INLET
WINSLOW
530000

BREMERTON SHORELINE TYPES



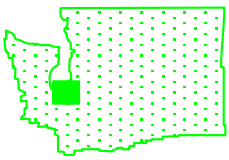
CENTRAL PUGET SOUND GRP

SEATTLE SHORELINE TYPES



CENTRAL PUGET SOUND GRP

EAST PASSAGE SHORELINE TYPES



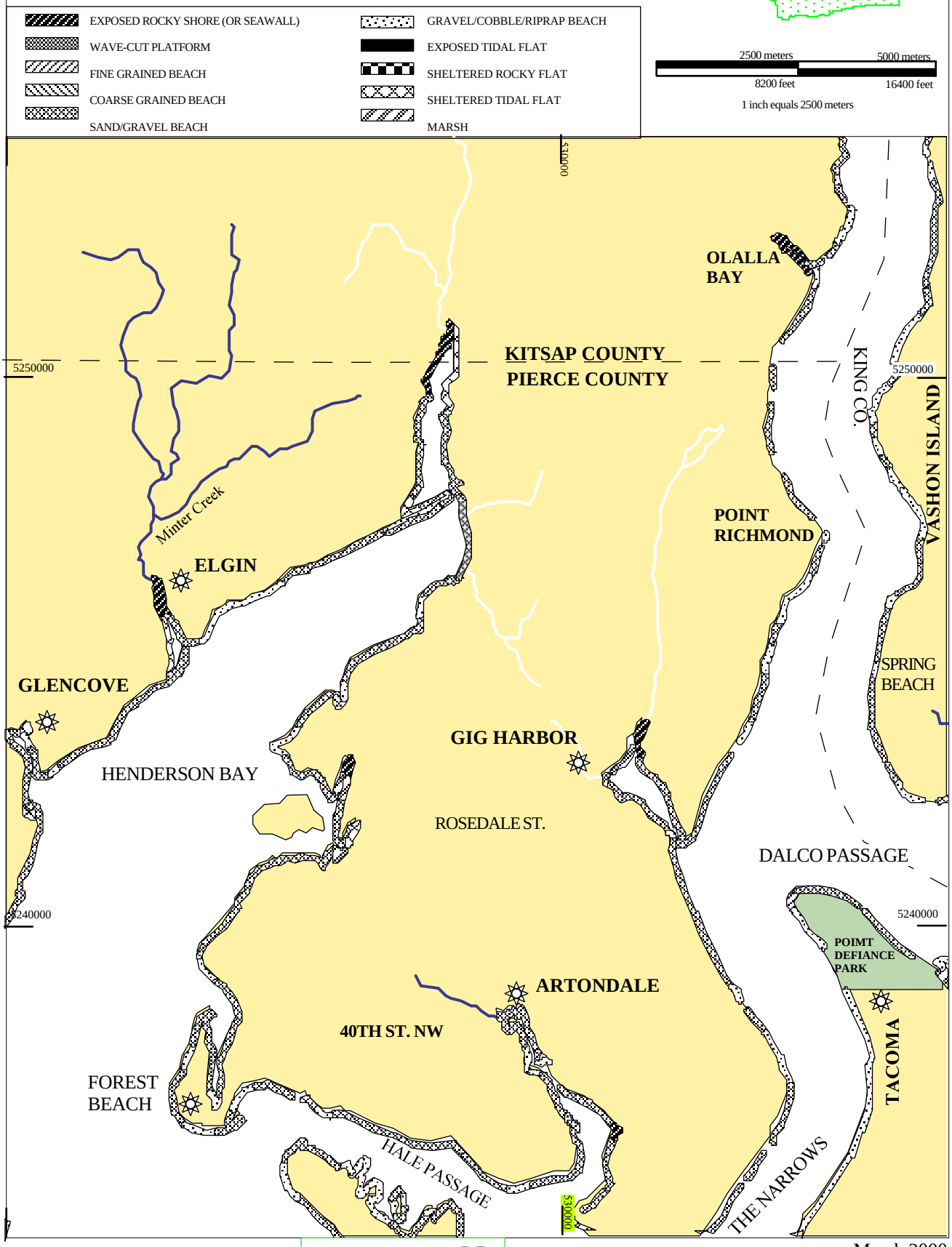
EXPOSED ROCKY SHORE (OR SEAWALL)
WAVE-CUT PLATFORM
FINE GRAINED BEACH
COARSE GRAINED BEACH
SAND/GRAVEL BEACH
GRAVEL/COBBLE/RIPRAP BEACH
EXPOSED TIDAL FLAT
SHELTERED ROCKY FLAT
SHELTERED TIDAL FLAT
MARSH

2500 meters 5000 meters
8200 feet 16400 feet
1 inch equals 2500 meters

KITSAP CO.
KING CO.
5250000
550000
BURIEN
TUKWILA
VASHON ISLAND
THREE TREE PT
PUGET SOUND
EAST PASSAGE
Judd Creek
TRAMP
HBR
Des Moines Marina
Sling Launch
5240000
MIDWAY
MAURY
ISLAND
QUARTER-
MASTER HBR
SALTWATER
STATE PARK
DOCKTON
POVERTY
BAY
REDONDO

CENTRAL PUGET SOUND GRP

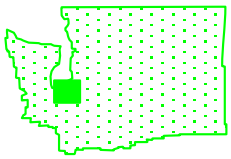
GIG HARBOR SHORELINE TYPES



March 2000

COMMENCEMENT BAY SHORELINE TYPES

CENTRAL PUGET SOUND GRP



EXPOSED ROCKY SHORE (OR SEAWALL)
WAVE-CUT PLATFORM
FINE GRAINED BEACH
COARSE GRAINED BEACH
SAND/GRAVEL BEACH
GRAVEL/COBBLE/RIPRAP BEACH
EXPOSED TIDAL FLAT
SHELTERED ROCKY FLAT
SHELTERED TIDAL FLAT
MARSH

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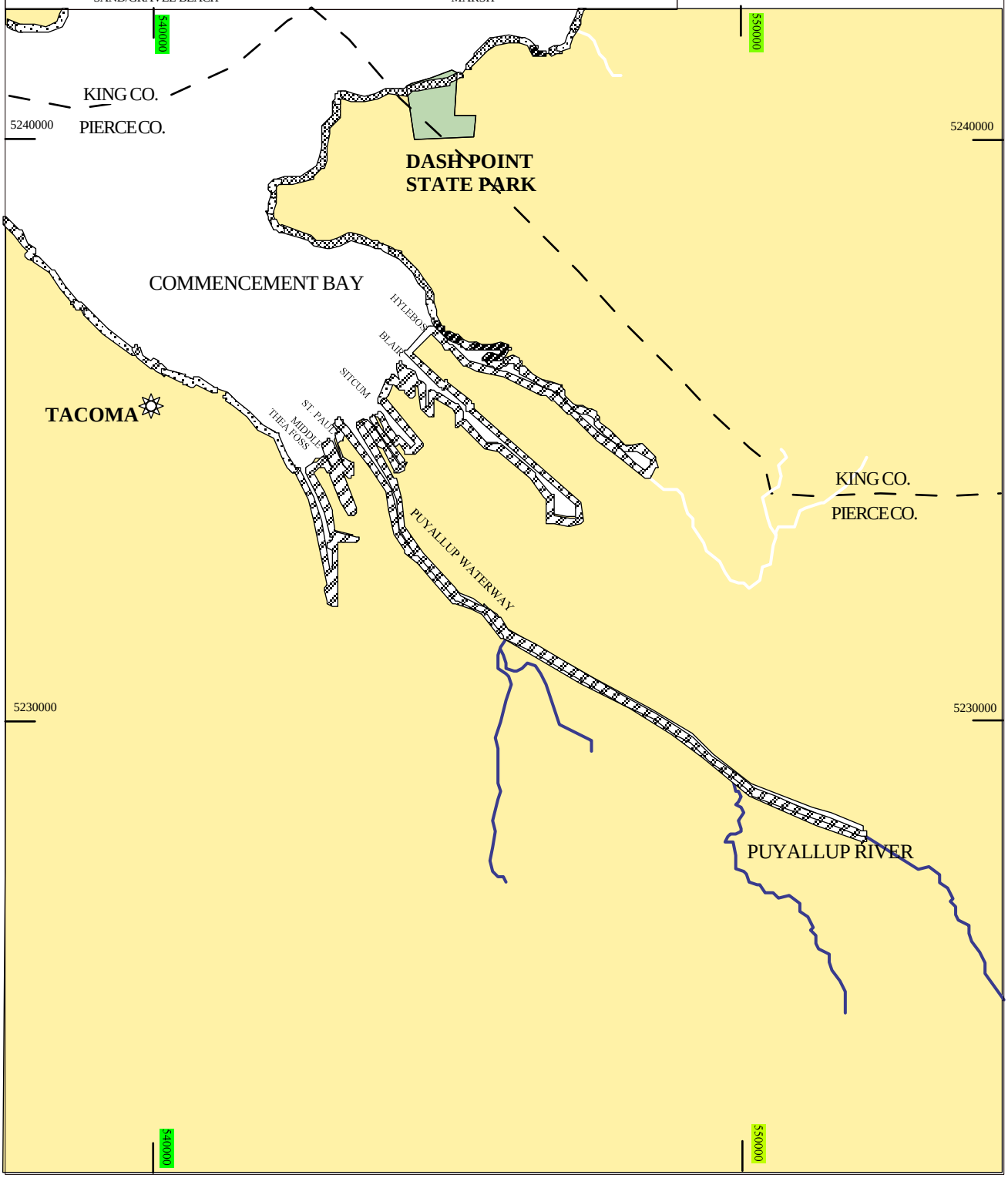

5.3 Shoreline Countermeasure Matrices

The matrices included here show which shoreline countermeasure techniques have been considered for the fourteen shoreline types described in Chapter 2 of the "Shoreline Countermeasures Manual & Matrices", Northwest Area Plan, Chapter 9650, Page 9-37. Four matrices have been constructed for the major categories of oil (heavy, medium, light, very light).

Countermeasure methods are described in Chapters 3 and 4 of the manual. Countermeasures in Chapter 3 are traditional or conventional techniques that the OSC can use without any additional concurrence. However, the cutting of vegetation countermeasure should be used only during specific seasonal windows under specific conditions and with landowner approval. Countermeasures in Chapter 4 are described under a separate section called "Shoreline Countermeasure Methods Using Alternative Technology" may be useful in certain situations. These methods are considered more experimental and controversial in their application and potential impacts and require more formal review and consultation before implementing. The exact requirements are spelled out in the National Contingency Plan and the Northwest Area Plan. The Shoreline Countermeasures Matrices are a particularly dynamic component of the manual and should continue to be revised as the existing techniques are used and evaluated, and as both old and new techniques are refined.

Each matrix has a written explanation of how it is to be used as a countermeasure advisability matrix. The matrices are only a general guide for removing oil from shoreline substrates. They must be used in conjunction with the entire "Shoreline Countermeasures Manual" plus field observations and scientific advice. The countermeasures listed are not necessarily the best under all circumstances, and any listed technique may need to be used in conjunction with other techniques (including ones not listed herein). The Federal On-Scene Coordinator (FOSC) or the State OSC operating with the FOSC's authorization has the responsibility for and authority to determine which countermeasure(s) are appropriate for the various situations encountered.

Selection of countermeasure techniques to be used in each spill is based upon the degree of oil contamination, shoreline types, and the presence of sensitive resources. Extremely sensitive areas are generally limited to manual cleanup methods. It is important to note that the primary goal of countermeasure implementation is the removal of oil from the shoreline with no further injury or destruction to the environment. The three categories of guidance used in the matrices are defined as follows:

R	Recommended	May be the preferred method that best achieves the goal of minimizing destruction or injury to the environment
C	Conditional	Viable and possibly useful but may result in limited adverse effects to the environment
	Shaded	Not applicable or not generally recommended.

SHORELINE COUNTERMEASURES MATRIX

Heavy Oil (Heavy Crude Oils, Intermediate Fuel Oils, Bunker C & Heavily Weathered Medium Crudes)

- Heavy oils with little or no evaporation or dissolution
- Water-soluble fraction likely to be <10ppm
- Heavy contamination of intertidal areas likely
- Severe impacts to waterfowl and fur-bearing mammals (coating and ingestion)
- Long-term contamination to sediments possible
- Weathers very slowly
- Dispersion seldom effective
- Shoreline cleanup difficult under all conditions

SHORELINE TYPES CODES

1- Exposed rock shores and vertical, hard man-made structure (e.g. seawalls)
2 - Exposed wave-cut platforms
3 - Fine to medium grained sand beaches & steep unvegetated river banks
4 - Course grained sand beaches
5 - Mixed sand and gravel beaches, including artificial fill containing a range of grain size and material
6A - Gravel beaches - pebbles to cobble
6B - Gravel beaches - cobbles to boulders
6C - Exposed rip rap
7 - Exposed tidal flat
8A- Sheltered vertical rock shores and vertical, hard man-made structures (e.g. seawalls, docks, bulkheads)
8B - Sheltered rubble slope
9A - Sheltered sand and mud flats
9B - Sheltered vegetated low bank
10 - Marshes

COUNTERMEASURES	SHORELINE TYPES 1	2	3	4	5	6A	6B	6C	7	8A	8B	9A	9B	10
CONVENTIONAL METHODS														
No action	C	C	C	C	C	C	C	C	R	C	C	R	C	R
Manual removal of oil	C	R	R	R	R	C	C	C		R	R		C	C
Passive collection of oil	R	R	R	R	R	R	R	R	C	R	R	C	R	R
Oiled debris removal	C	R	R	R	R	R	R	R	C	R	R	C	R	C
Trenching/recovery wells			C	C	C									
Oiled sediment removal			C	C	C	C		C					C	
Ambient water flooding (Deluge)			C	C	C	R	R	R		R	R		C	C
Amb water flush <50 psi	C	C			C	R	C	R		C	C		C	C
Amb water flush <100 psi	C	C					C	C		C	C			
Warm water flush <90°F	C						C	C		C				
Hot water flush >90°F	C									C				
Vacuum removal of oil	C	C	C	C	C	C	C	C		C	C		C	C
Sediment reworking			C	C	C	C								
Sediment Removal-cleaning-replacement			C	C	C	C		C						
Cutting oiled vegetation							C	C		C	C		C	C
ALTERNATIVE METHODS*														
In-situ burning on shore														
Chemical stabilization, protection, cleaning														
Nutrient enhancement			C	C	C	C	C	C						C
Microbial addition														

R Recommend - May be Preferred Alternative
C Conditional (Refer to NW Shoreline Countermeasures Manual)
Shaded areas are Not Applicable or Not Generally Recommened
***** Follow approved process defined in NCP and NW Area Plan

This countermeasure advisability matrix is only a general guide for removal of oil from shoreline substrates. It must be used in conjunction with the entire Shoreline Countermeasures Manual plus field observations and scientific advice. The countermeasures listed are not necessarily the best under all circumstances, and any listed technique may need to be used in conjunction with other techniques (including ones not listed herein). The Federal On-Scene Coordinator (FOSC) or the state OSC operating with the FOSC's authorization has the responsibility for and the authority to determine which countermeasure(s) are appropriate for various situations encountered. Selection of countermeasures is based on the degree of oil contamination, the shoreline type, and the presence of sensitive resources.

SHORELINE COUNTERMEASURES MATRIX

Medium Oil (Most Crude Oils & Some Heavily Weathered Light Crudes)

- About 1/3 will evaporate within 24 hours
- Maximum water-soluble fraction is 10-100ppm
- Oil contamination of intertidal areas can be severe and long-term
- Impact to waterfowl and fur-bearing mammals can be severe
- Chemical dispersion is an option within 1-2 days
- Cleanup most effective if conducted quickly

SHORELINE TYPES CODES

1- Exposed rock shores and vertical, hard man-made structure (e.g. seawalls)
2 - Exposed wave-cut platforms
3 - Fine to medium grained sand beaches & steep unvegetated river banks
4 - Course grained sand beaches
5 - Mixed sand and gravel beaches, including artificial fill containing a range of grain size and material
6A - Gravel beaches - pebbles to cobble
6B - Gravel beaches - cobbles to boulders
6C - Exposed rip rap
7 - Exposed tidal flat
8A- Sheltered vertical rock shores and vertical, hard man-made structures (e.g. seawalls, docks, bulkheads)
8B - Sheltered rubble slope
9A - Sheltered sand and mud flats
9B - Sheltered vegetated low bank
10 - Marshes

COUNTERMEASURES	SHORELINE TYPES 1	2	3	4	5	6A	6B	6C	7	8A	8B	9A	9B	10
CONVENTIONAL METHODS														
No action	C	C	C	C	C	C	C	C	R	C	C	R	C	R
Manual removal of oil	C	R	R	R	R	C	C	C		R	R		C	C
Passive collection of oil	R	R	R	R	R	R	R	R	C	R	R	R	R	R
Oiled debris removal	C	R	R	R	R	R	R	R	C	R	R	C	R	C
Trenching/recovery wells			C	C	C									
Oiled sediment removal			C	C	C	C							C	
Ambient water flooding (Deluge)			C	C	C	R	R	R		R	R		C	C
Amb water flush <50 psi	C	C			C	R	C	R		R	R		C	C
Amb water flush <100 psi	C	C					C	C		C				
Warm water flush <90°F	C						C	C		C				
Hot water flush >90°F	C									C				
Vacuum removal of oil	C	C	R	R		C	R	R		C	C		C	C
Sediment reworking			C	C	C	C								
Sediment Removal-cleaning-replacement			C	C	C	C		C			C			
Cutting oiled vegetation							C	C		C	C		C	C
ALTERNATIVE METHODS*														
In-situ burning on shore														
Chemical stabilization, protection, cleaning														
Nutrient enhancement			C	C	C	C	C	C			C			C
Microbial addition														

R Recommend - May be Preferred Alternative
C Conditional (Refer to NW Shoreline Countermeasures Manual)
Shaded areas are Not Applicable or Not Generally Recommened
***** Follow approved process defined in NCP and NW Area Plan

This countermeasure advisability matrix is only a general guide for removal of oil from shoreline substrates. It must be used in conjunction with the entire Shoreline Countermeasures Manual plus field observations and scientific advice. The countermeasures listed are not necessarily the best under all circumstances, and any listed technique may need to be used in conjunction with other techniques (including ones not listed herein). The Federal On-Scene Coordinator (FOSC) or the state OSC operating with the FOSC's authorization has the responsibility for and the authority to determine which countermeasure(s) are appropriate for various situations encountered. Selection of countermeasures is based on the degree of oil contamination, the shoreline type, and the presence of sensitive resources.

SHORELINE COUNTERMEASURES MATRIX

Light Oil (Diesel, No 2 Fuel Oils, Light Crudes)

- Moderately volatile; will leave residue (up to 1/3 of spilled amount)
- Moderate concentrations of toxic (soluble) compounds
- Long-term contamination of intertidal resources possible
- Potential for subtidal impacts (dissolution, mixing, sorption onto suspended sediments)
- No dispersion necessary
- Cleanup can be very effective

SHORELINE TYPES CODES

1- Exposed rock shores and vertical, hard man-made structure (e.g. seawalls)
2 - Exposed wave-cut platforms
3 - Fine to medium grained sand beaches & steep unvegetated river banks
4 - Course grained sand beaches
5 - Mixed sand and gravel beaches, including artificial fill containing a range of grain size and material
6A - Gravel beaches - pebbles to cobble
6B - Gravel beaches - cobbles to boulders
6C - Exposed rip rap
7 - Exposed tidal flat
8A- Sheltered vertical rock shores and vertical, hard man-made structures (e.g. seawalls, docks, bulkheads)
8B - Sheltered rubble slope
9A - Sheltered sand and mud flats
9B - Sheltered vegetated low bank
10 - Marshes

COUNTERMEASURES	SHORELINE TYPES 1	2	3	4	5	6A	6B	6C	7	8A	8B	9A	9B	10
CONVENTIONAL METHODS														
No action	R	R	C	C	C	C	C	C	R	C	C	R	C	R
Manual removal of oil			C	C	C	C	C	C		R	R		C	
Passive collection of oil	C	R	R	R	R	R	R	R	C	R	R	C	R	R
Oiled debris removal	C	C	R	R	R	R	R	R	C	R	R	C	C	C
Trenching/recovery wells			C	C	C									
Oiled sediment removal			C	C	C	C								
Ambient water flooding (Deluge)			C	C	C	R	R	R			C			C
Amb water flush <50 psi		C			C	C	C	C		R	C			C
Amb water flush <100 psi														
Warm water flush <90°F														
Hot water flush >90°F														
Vacuum removal of oil							C	C						C
Sediment reworking			C	C	C	C								
Sediment Removal-cleaning-replacement			C	C	C									
Cutting oiled vegetation							C	C		C	C		C	C
ALTERNATIVE METHODS*														
In-situ burning of shore														
Chemical stabilization, protection, cleaning														
Nutrient enhancement			C	C	C	C	C	C						C
Microbial addition														

R Recommend - May be Preferred Alternative
C Conditional (Refer to NW Shoreline Countermeasures Manual)
Shaded areas are Not Applicable or Not Generally Recommened
***** Follow approved process defined in NCP and NW Area Plan

This countermeasure advisability matrix is only a general guide for removal of oil from shoreline substrates. It must be used in conjunction with the entire Shoreline Countermeasures Manual plus field observations and scientific advice. The countermeasures listed are not necessarily the best under all circumstances, and any listed technique may need to be used in conjunction with other techniques (including ones not listed herein). The Federal On-Scene Coordinator (FOSC) or the state OSC operating with the FOSC's authorization has the responsibility for and the authority to determine which countermeasure(s) are appropriate for various situations encountered. Selection of countermeasures is based on the degree of oil contamination, the shoreline type, and the presence of sensitive resources.

SHORELINE COUNTERMEASURES MATRIX

Very Light Oil (Jet fuels, Gasoline)

- Highly volatile (should all evaporate within 1-2 days)
- High concentration of toxic (soluble) compounds
- Result: Localized, severe impacts to water column and intertidal resources
- Duration of impact is a function of the resource recovery rate
- No dispersion necessary

SHORELINE TYPES CODES

1- Exposed rock shores and vertical, hard man-made structure (e.g. seawalls)
2 - Exposed wave-cut platforms
3 - Fine to medium grained sand beaches & steep unvegetated river banks
4 - Course grained sand beaches
5 - Mixed sand and gravel beaches, including artificial fill containing a range of grain size and material
6A - Gravel beaches - pebbles to cobble
6B - Gravel beaches - cobbles to boulders
6C - Exposed rip rap
7 - Exposed tidal flat
8A- Sheltered vertical rock shores and vertical, hard man-made structures (e.g. seawalls, docks,
8B - Sheltered rubble slope
9A - Sheltered sand and mud flats
9B - Sheltered vegetated low bank
10 - Marshes

COUNTERMEASURES	SHORELINE TYPES 1	2	3	4	5	6A	6B	6C	7	8A	8B	9A	9B	10
CONVENTIONAL METHODS														
No action	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Manual removal of oil														
Passive collection of oil			C	C	C	C	C	C						
Oiled debris removal	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Trenching/recovery wells			C	C	C									
Oiled sediment removal														
Ambient water flooding (Deluge)														C
Amb water flush <50 psi														
Amb water flush <100 psi														
Warm water flush <90°F														
Hot water flush >90°F														
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Cutting oiled vegetation														
ALTERNATIVE METHODS*														
In-situ burning on shore														
Chemical stabilization, protection, cleaning														
Nutrient enhancement														
Microbial addition														

R Recommend - May be Preferred Alternative
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6. Sensitive Resource Description*

6.1. Marine Mammals

While marine mammals can be expected anywhere in the Central Puget Sound, their numbers are lower here than in any other GRP area. Although harbor seals can be found throughout, there are very few regular haulout locations. California and Steller (Northern) sea lions may be found within this region from late fall through mid-spring, especially in the vicinity of river mouths or on navigation buoys. Although relatively few Steller sea lions are found in this area, this species is of special concern because it is listed as a Threatened species. Other marine mammals occasionally found in Central Puget Sound include Dall's porpoise, harbor porpoise, orcas (killer whales), and gray whales. Only the harbor seal and harbor porpoise are considered year around residents.

6.2. Birds

Although many species of birds nest and rear their young throughout the summer in this GRP area, the numbers and diversity of species increases dramatically during the migration and winter seasons. Breeding birds include great blue heron, osprey, bald eagle, glaucous-winged gull, pigeon guillemot and marbled murrelet. Species that pass through on spring and fall migration or winter here in large numbers include common, Pacific, and red-throated loons, horned red-necked and western grebes, double-crested, pelagic and Brandt's cormorants, Canada geese, brant, more than twenty species of ducks, over twenty species of shorebirds, Bonaparte's, mew, ring-billed, herring and Thayer's gulls, common murres and rhinoceros auklets.

Birds can be found in all parts of this GRP area but certain locations can be counted on to support large bird concentrations during the appropriate time of year. Shallow intertidal bays such as Quartermaster Harbor, Sinclair Inlet, and Miller Bay host large numbers of waterfowl, shorebirds and herons.

Areas where tides converge to create tide rips tend to concentrate baitfish such as herring and sandlance. Fish eating birds including loons, grebes, cormorants, gulls and alcids also congregate at these locations. Some of the major seabird concentration areas include Colvos Passage and the waters off of Point Defiance.

The three Endangered or Threatened species that breed in this GRP area are bald eagle, peregrine falcon and marbled murrelet.

6.3. Flight Restriction Zones

Flight restriction zones have been designated in the GRP to minimize disturbance to certain wildlife species. An identified location could represent a marine mammal haulout site, a seabird or heron colony, or the individual nest of a sensitive species such as bald eagle. While some zones may be restricted year around, others will be in effect only during the months listed in the matrix.

The no-fly bubble is the area within a 1,500 foot radius and below 1,000 feet in altitude around the location.

All aircraft, including those from the government, contractors or media, are expected to avoid these zones when restrictions are in effect. In the event that one of these zones must be entered during a spill response, clearance must be obtained from the Washington Department of Fish and Wildlife (WDF&W) and the United States Fish and Wildlife Service (USFWS), or when marine mammals other than sea otters are concerned, the National Marine Fisheries Service (NMFS). Sea otters are managed by the United States Fish and Wildlife Service.

* Generated for the GRP by the Spill Response and Resource Protection Team of the Washington Department of Fish and Wildlife

During oil spills, pilots are also asked to avoid disturbing any large concentrations of birds and other wildlife. By keeping a safe distance or altitude, pilots can prevent the accidental hazing of unaffected wildlife into oiled areas and minimize the risk of aircraft/ bird collisions.

6.4. Hazing

Hazing or directed harassment, is a method used to drive or herd wildlife out of an area where they are at risk of becoming oiled. Hazing techniques include the use of visual and audio devices, personnel for herding, vessels and aircraft. In the right circumstances it can be an effective tool for protecting some wildlife species. In other cases it can be disastrous as unaffected wildlife can be driven into oiled areas, or forced to abandon nests or young.

National Marine Fisheries Service staff or their designees will perform all hazing of marine mammals other than sea otters. Before hazing can begin for all other species of wildlife, clearance must be obtained from the Washington Department of Fisheries and Wildlife and the United States Fish and Wildlife Service. All hazing efforts during a spill will be directed by these agencies. The deliberate harassment of wildlife without first securing permission from these agencies is a violation of Federal and State laws.

The following information must be provided for a determination on whether hazing might be authorized in a given situation.

1. Description of the situation where hazing authorization is being sought
2. Location to be hazed
3. Species of wildlife to be hazed and number of animals
4. Methods and equipment used
5. Date and time of hazing
6. Name, phone number, radio frequency, pager number and the amount of hazing experience of the individual requesting permission

The responsible agencies will evaluate each request on a case by case basis. All hazing of marine mammals, threatened and endangered species, and all hazing by aircraft will be performed only under authority and general supervision of WDF&W, USFWS, NMFS or persons designated by these agencies. Representatives of these agencies can be contacted through the planning section of the Unified Command System during the spill event.

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EDMONDS FLIGHT RESTRICTION ZONES / SENSITIVE WILDLIFE

NOAA Chart 18474

Code	Location	Seabird Colony	Seabird Conc.	Waterfowl Conc.	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc.	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
WC-2	Apple Cove Point					**Yes**		**Yes**												
WC-3	Deer Creek					**Yes**		**Yes**												
WC-4	South Appletree Cove					**Yes**		**Yes**												
WC-5	President Point					**Yes**		**Yes**												
WC-6	Point Jefferson					**Yes**		**Yes**												
WC-12	Shilshole Bay					**Yes**		**Yes**												

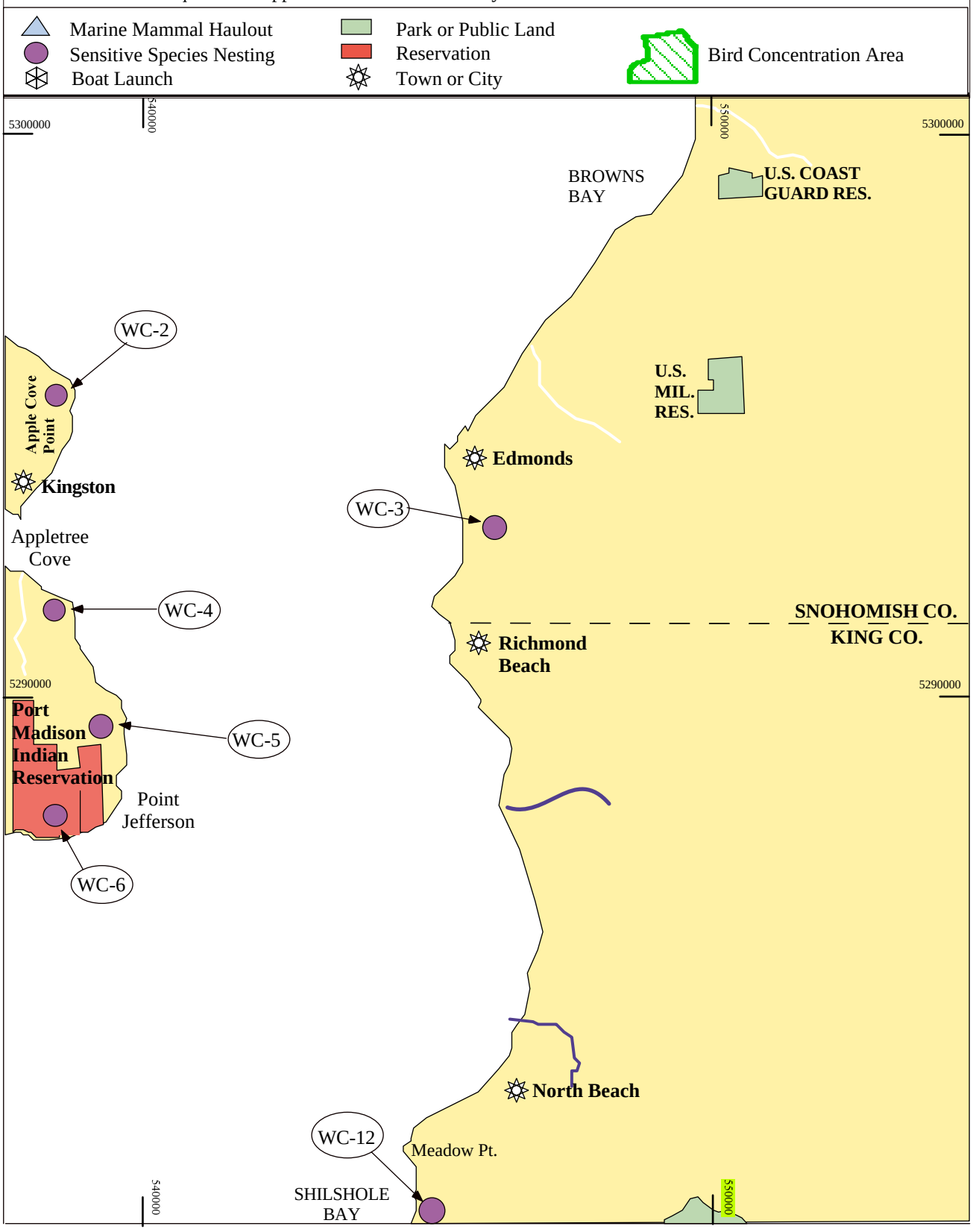
* FLIGHT AND GROUND ENTRY RESTRICTIONS

Flights below 1000 feet require clearance: See appendix on Flight Restriction Zones

Sensitive season - Minimize overflight disturbance

EDMONDS
FLIGHT RESTRICTION ZONES FOR SENSITIVE WILDLIFE SPECIES

1. Pilots refer to the chapter on Flight Restriction Zones.
2. All ground entry within 100 yards of sensitive nesting species is restricted.
3. All boaters are requested to approach no closer than 100 yards to seal and waterfowl concentrations.



PORT MADISON FLIGHT RESTRICTION ZONES / SENSITIVE WILDLIFE

1/2 Includes half of the month

NOAA Chart 18474

Code	Location	Seabird Colony	Seabird Conc.	Waterfowl Conc.	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc.	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
WC-7	Miller Bay			**Yes**		**Yes**		No												
WC-8	Keyport Dock	**Yes**						No												
WC-9	Keyport					**Yes**		**Yes**												
WC-10	Port Madison					**Yes**		**Yes**												
WC-16	Dyes Inlet/ Clear Creek			**Yes**				**Yes**					**1/2**			**1/2**				

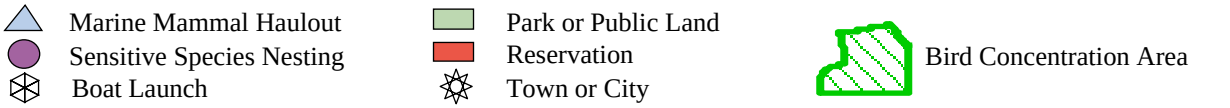
* FLIGHT AND GROUND ENTRY RESTRICTIONS

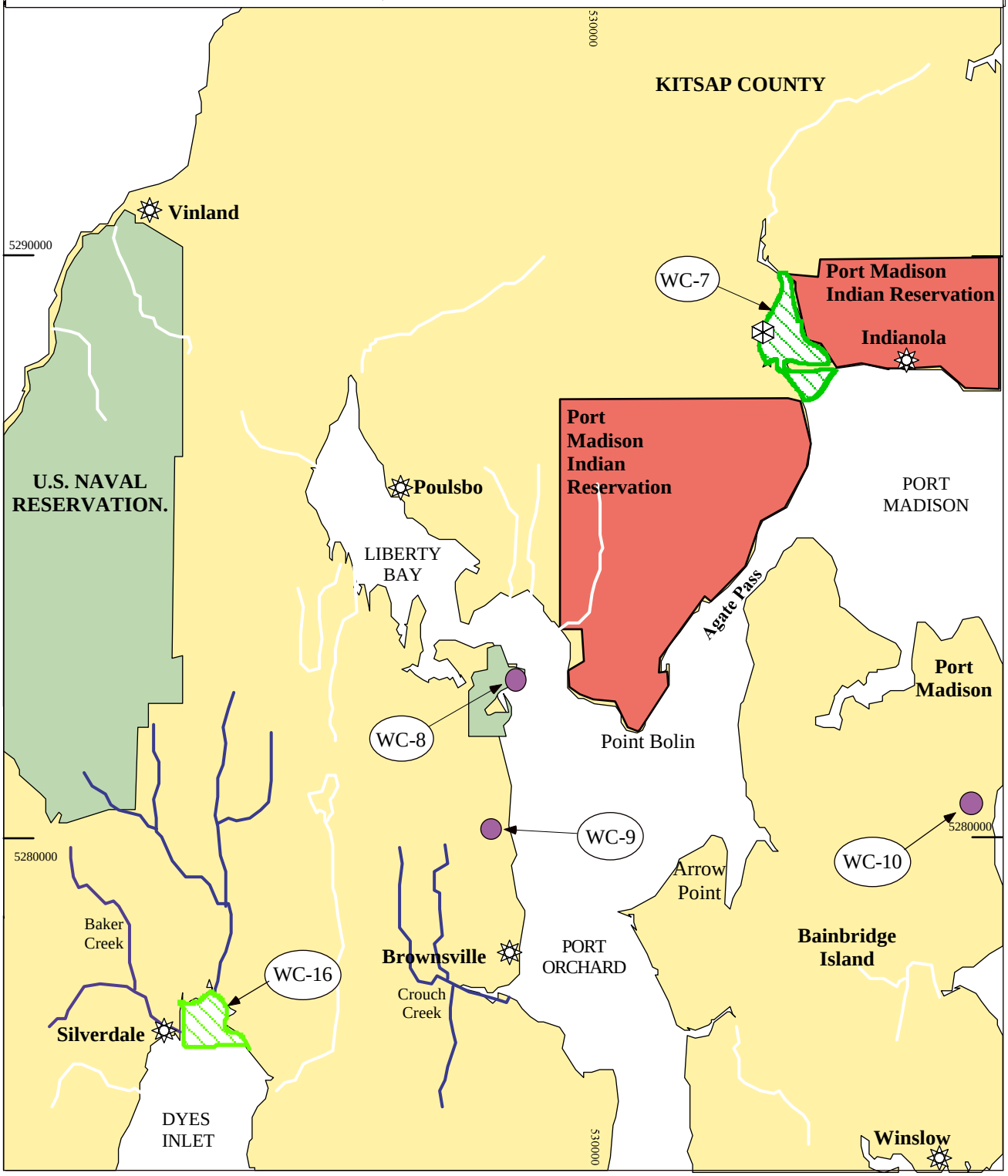
Flights below 1000 feet require clearance: See appendix on Flight Restriction Zones

Sensitive season - Minimize overflight disturbance

PORT MADISON
FLIGHT RESTRICTION ZONES FOR SENSITIVE WILDLIFE SPECIES

1. Pilots refer to the chapter on Flight Restriction Zones.
2. All ground entry within 100 yards of sensitive nesting species is restricted.
3. All boaters are requested to approach no closer than 100 yards to seal and waterfowl concentrations.





1/2	Includes half of the month

BREMERTON FLIGHT RESTRICTION ZONES / SENSITIVE WILDLIFE

NOAA Chart 18474

Code	Location	Seabird Colony	Seabird Conc.	Waterfowl Conc.	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc.	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
WC-17	Ostrich Bay					**Yes**		**Yes**												
WC-18	Rocky Point			**Yes**				**Yes**					**1/2**			**1/2**				
WC-19	Sulpher Springs			**Yes**				**Yes**					**1/2**			**1/2**				
WC-20	South Port Washington Narrows			**Yes**				**Yes**												
WC-21	Gorst		**Yes**	**Yes**			**Yes**	**Yes**												
WC-22	East Port Orchard			**Yes**				**Yes**					**1/2**			**1/2**				
WC-23	Orchard Point			**Yes**				**Yes**					**1/2**							
WC-28	Sinclair Inlet					**Yes**		**Yes**												
WC-30	View Park					**Yes**		**Yes**												
WC-33	Command Point					**Yes**		**Yes**												
WC-35	Colvos Passage		**Yes**					No												
WC-45	Illahee					**Yes**		**Yes**												
WC-46	South tip of Bainbridge Island			**Yes**				No												

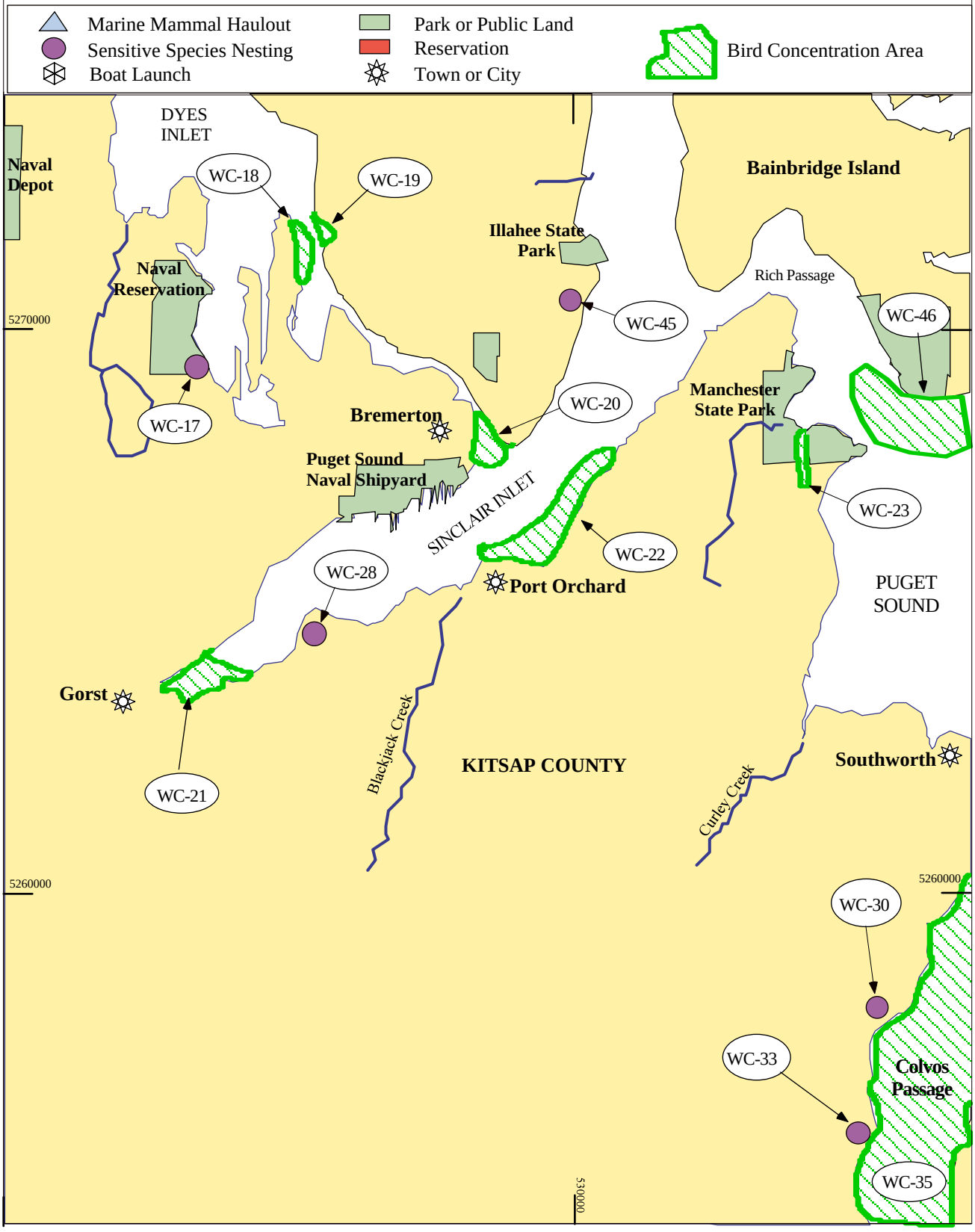
* FLIGHT AND GROUND ENTRY RESTRICTIONS

Flights below 1000 feet require clearance: See appendix on Flight Restriction Zones

Sensitive season - Minimize overflight disturbance

BREMERTON
FLIGHT RESTRICTION ZONES FOR SENSITIVE WILDLIFE SPECIES

1. Pilots refer to the chapter on Flight Restriction Zones.
2. All ground entry within 100 yards of sensitive nesting species is restricted.
3. All boaters are requested to approach no closer than 100 yards to seal and waterfowl concentrations.



1/2	Includes half of the month

SEATTLE FLIGHT RESTRICTION ZONES / SENSITIVE WILDLIFE

NOAA Chart 18474

Code	Location	Seabird Colony	Seabird Conc.	Waterfowl Conc.	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc.	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
WC-13	Shilshole Bay				**Yes**			**Yes**												
WC-14	Yeomalt Point					**Yes**		**Yes**												
WC-24	Restoration Point					**Yes**		**Yes**												
WC-29	Blake Island					**Yes**		**Yes**												
WC-35	Colvos Passage		**Yes**					No												
WC-46	South tip of Bainbridge Island			**Yes**				No					**1/2**							
WC-47	Alki Point south to Point Williams			**Yes**				No												

* FLIGHT AND GROUND ENTRY RESTRICTIONS

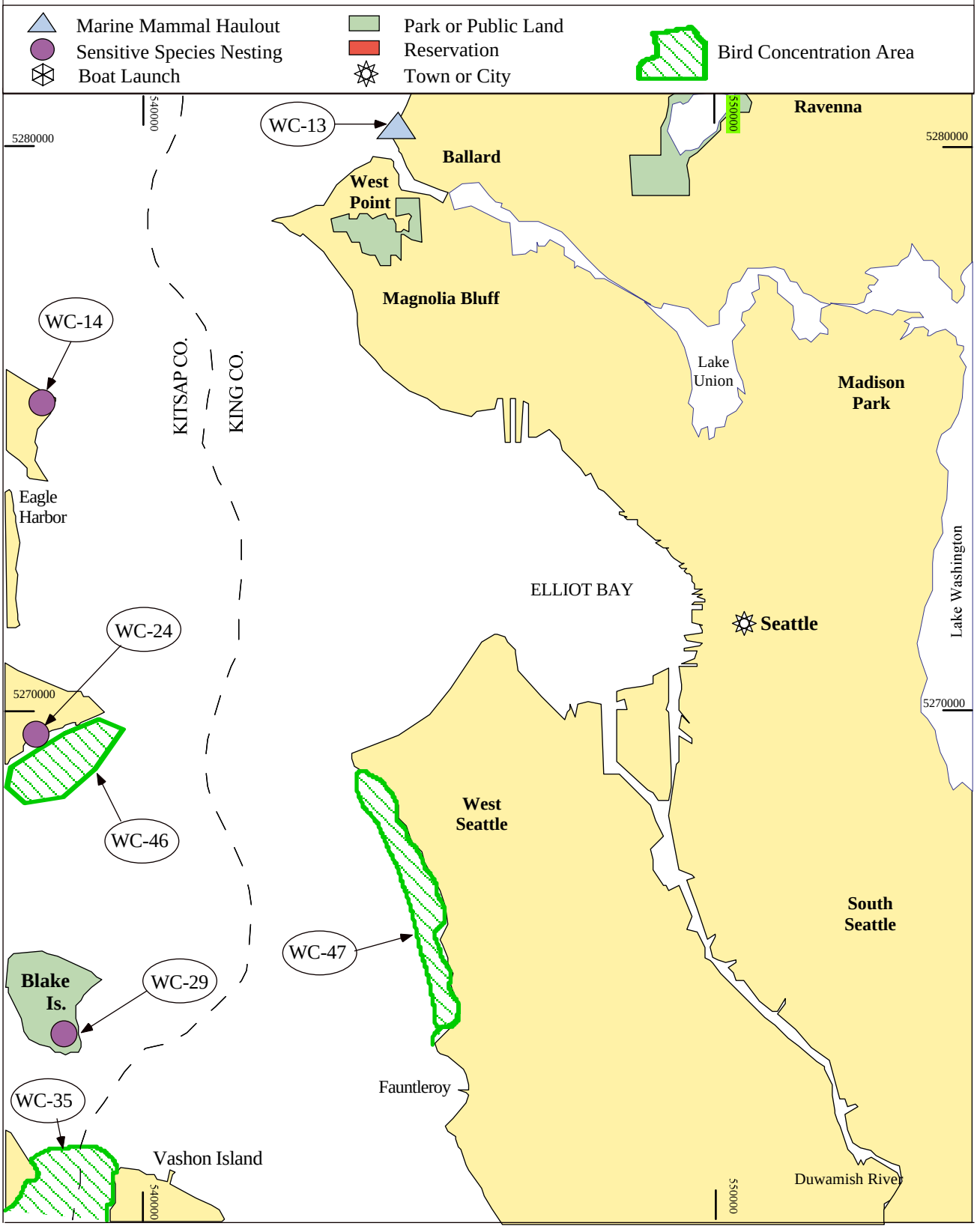
Flights below 1000 feet require clearance: See appendix on Flight Restriction Zones

Sensitive season - Minimize overflight disturbance

CENTRAL PUGET SOUND GRP

SEATTLE
FLIGHT RESTRICTION ZONES FOR SENSITIVE WILDLIFE SPECIES

1. Pilots refer to the chapter on Flight Restriction Zones.
2. All ground entry within 100 yards of sensitive nesting species is restricted.
3. All boaters are requested to approach no closer than 100 yards to seal and waterfowl concentrations.



1/2 Includes half of the month

EAST PASSAGE FLIGHT RESTRICTION ZONES / SENSITIVE WILDLIFE

NOAA Chart 18474

Code	Location	Seabird Colony	Seabird Conc.	Waterfowl Conc.	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc.	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
WC-31	Sylvan Beach					**Yes**		**Yes**												
WC-32	Seahurst					**Yes**		**Yes**		**1/2**										
WC-34	Point Beals					**Yes**		**Yes**												
WC-35	Colvos Passage		**Yes**					No												
WC-36	Quartermaster Harbor					**Yes**		**Yes**		**1/2**										
WC-38	Neill Point					**Yes**		**Yes**												
WC-40	Redondo					**Yes**		**Yes**												
WC-42	Dumas Bay					**Yes**		**Yes**												
WC-48	Quartermaster Harbor		**Yes**	**Yes**				No					**1/2**							

* FLIGHT AND GROUND ENTRY RESTRICTIONS

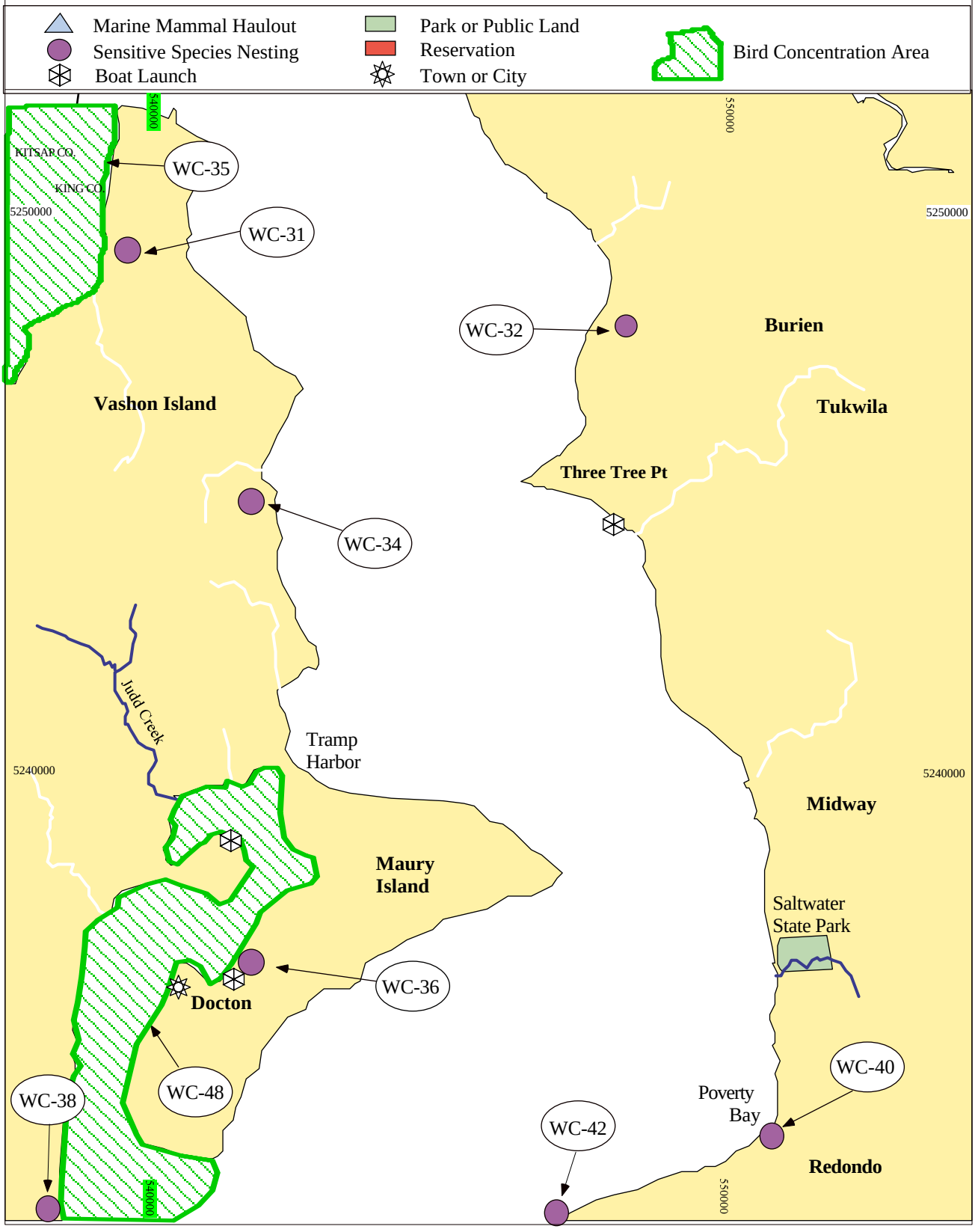
Flights below 1000 feet require clearance: See appendix on Flight Restriction Zones

Sensitive season - Minimize overflight disturbance

CENTRAL PUGET SOUND GRP

EAST PASSAGE
FLIGHT RESTRICTION ZONES FOR SENSITIVE WILDLIFE P

1. Pilots refer to the chapter on Flight Restriction Zones.
2. All ground entry within 100 yards of sensitive nesting species is restricted.
3. All boaters are requested to approach no closer than 100 yards to seal and waterfowl concentrations.



1/2	Includes half of the month

GIG HARBOR FLIGHT RESTRICTION ZONES / SENSITIVE WILDLIFE

NOAA Chart 18474

Code	Location	Seabird Colony	Seabird Conc.	Waterfowl Conc.	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc.	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
WSP-1	Tacoma Narrows		**Yes**	**Yes**				No				**1/2**								
WSP-2	Carr Inlet		**Yes**	**Yes**				No										**1/2**		
WSP-3	Burley Lagoon			**Yes**				No												
WSP-4	Rosedale Beach				**Yes**			**Yes**												
WSP-5	Cutts Island				**Yes**			**Yes**												
WSP-25	Horsehead Bay				**Yes**			**Yes**												
WC-35	Colvos Passage		**Yes**					No												
WC-37	Point Dalco					**Yes**		**Yes**												
WC-41	Point Defiance					**Yes**		**Yes**												

* FLIGHT AND GROUND ENTRY RESTRICTIONS

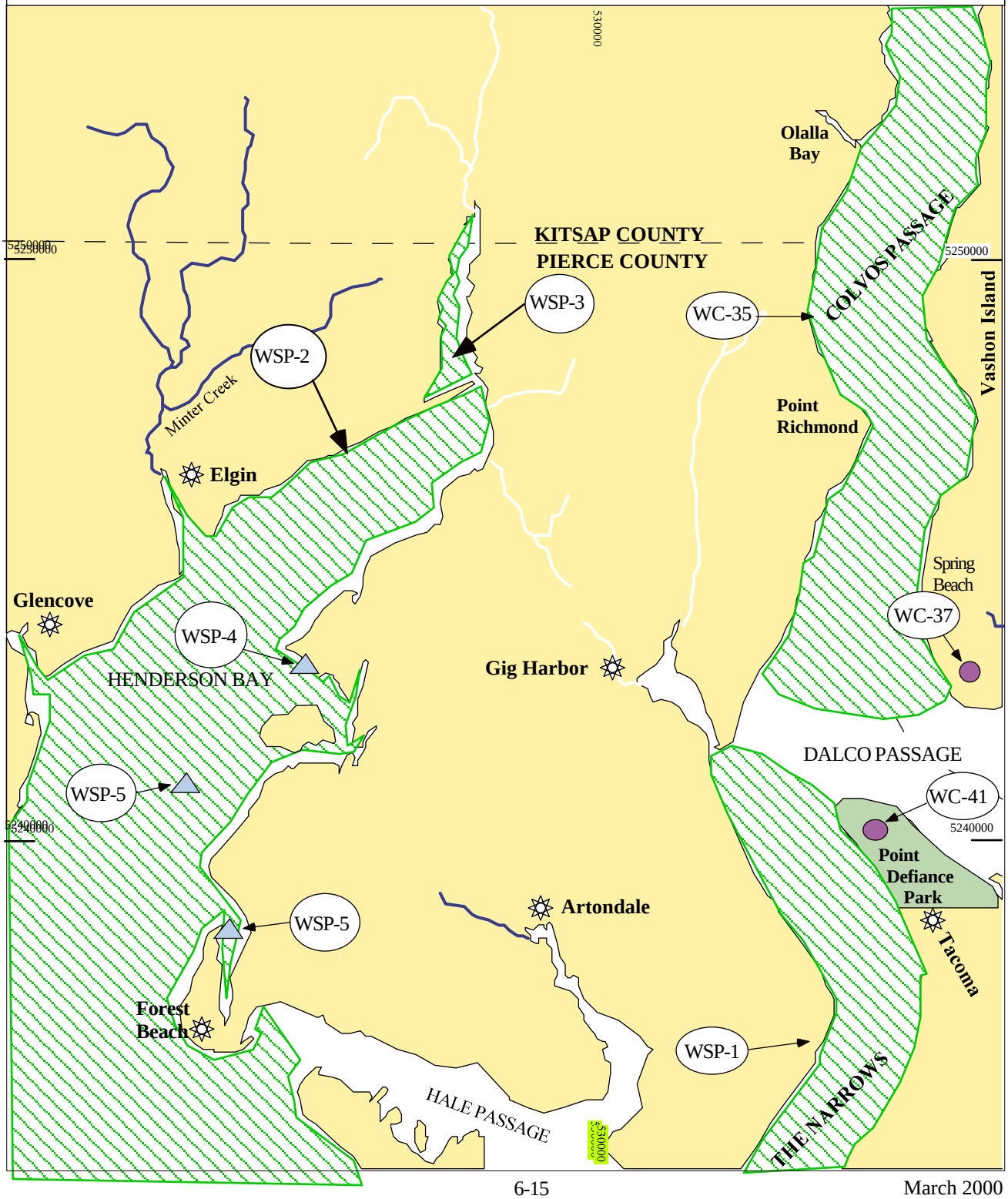
Flights below 1000 feet require clearance: See appendix on Flight Restriction Zones

Sensitive season - Minimize overflight disturbance

CENTRAL PUGET SOUND GRP

GIG HARBOR
FLIGHT RESTRICTION ZONES FOR SENSITIVE WILDLIFE SPECIES

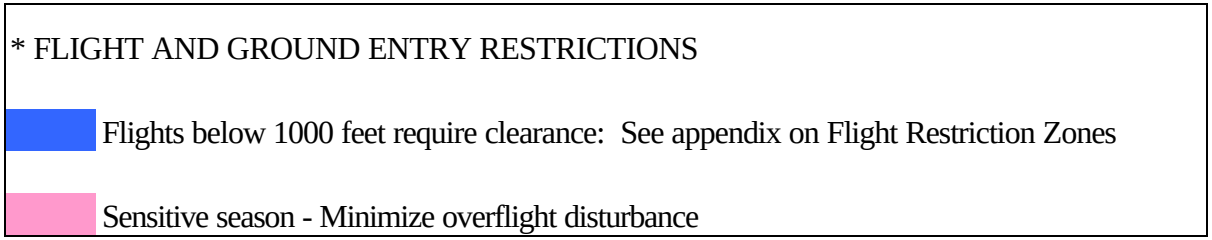
1. Pilots refer to the chapter on Flight Restriction Zones.
2. All ground entry within 100 yards of sensitive nesting species is restricted.
3. All boaters are requested to approach no closer than 100 yards to seal and waterfowl concentrations.



COMMENCEMENT BAY FLIGHT RESTRICTION ZONES / SENSITIVE WILDLIFE

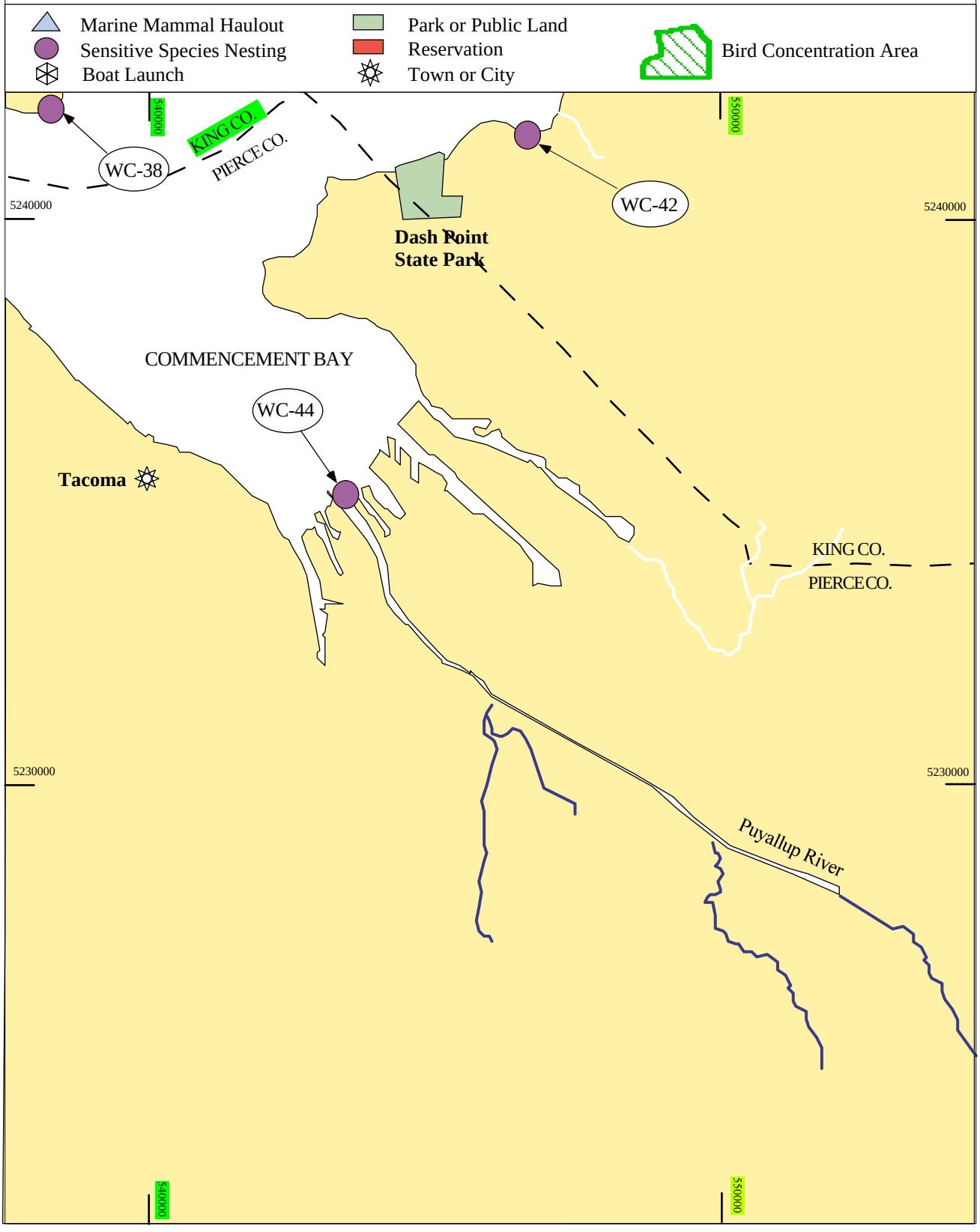
NOAA Chart 18474

Code	Location	Seabird Colony	Seabird Conc.	Waterfowl Conc.	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc.	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
WC-38	Neill Point					**Yes**		**Yes**												
WC-42	Dumas Bay					**Yes**		**Yes**												
WC-44	Commencement Bay			**Yes**				**Yes**												



COMMENCEMENT BAY
FLIGHT RESTRICTION ZONES FOR SENSITIVE WILDLIFE SPECIES

1. Pilots refer to the chapter on Flight Restriction Zones.
2. All ground entry within 100 yards of sensitive nesting species is restricted.
3. All boaters are requested to approach no closer than 100 yards to seal and waterfowl concentrations.



FLIGHT RESTRICTION ZONES / SENSITIVE WILDLIFE SUMMARY

Code	Location	Seabird Colony	Seabird Conc.	Waterfowl Conc.	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc.	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
WC-2	Apple Cove Point					Yes		Yes		■	■	■	■	■	■					
WC-3	Deer Cove					Yes		Yes		■	■	■	■	■	■					
WC-4	South Appletree Cove					Yes		Yes		■	■	■	■	■	■					
WC-5	President Point					Yes		Yes		■	■	■	■	■	■					
WC-6	Point Jefferson					Yes		Yes		■	■	■	■	■	■					
WC-7	Miller Bay			Yes				No	■	■	■	■	■	■	■	■	■	■	■	■
WC-8	Keyport Dock	Yes						No				■	■	■	■	■	■			
WC-9	Keyport					Yes		Yes		■	■	■	■	■	■					
WC-10	Port Madison					Yes		Yes		■	■	■	■	■	■					
WC-12	Shilshole Bay					Yes		Yes		■	■	■	■	■	■					
WC-13	Shilshole Bay				Yes			Yes	■	■	■	■	■	■			■	■	■	■
WC-14	Yeomalt Point					Yes		Yes		■	■	■	■	■	■	■	■			
WC-16	Dyes Inlet / Clear Creek			Yes				Yes	■	■	■	■	■			■	■	■	■	■
WC-17	Ostrich Bay					Yes		Yes		■	■	■	■	■	■					
WC-18	Rocky Point			Yes				Yes	■	■	■	■	■			■	■	■	■	■
WC-19	Sulphur Springs			Yes				Yes	■	■	■	■	■			■	■	■	■	■
WC-20	South Port Washington Narrows			Yes				Yes	■	■	■	■	■			■	■	■	■	■
WC-21	Gorst		Yes	Yes			Yes	Yes	■	■	■	■	■	■	■	■	■	■	■	■
WC-22	East Port Orchard			Yes				Yes	■	■	■	■	■			■	■	■	■	■
WC-23	Orchard Point			Yes				Yes	■	■	■	■	■			■	■	■	■	■
WC-24	Restoration Point					Yes		Yes		■	■	■	■	■	■					
WC-28	Sinclair Inlet					Yes		Yes		■	■	■	■	■	■					
WC-29	Blake Island					Yes		Yes		■	■	■	■	■	■					
WC-30	View Park					Yes		Yes		■	■	■	■	■	■					

FLIGHT RESTRICTION ZONES / SENSITIVE WILDLIFE SUMMARY (continued)

Code	Location	Seabird Colony	Seabird Conc.	Waterfowl Conc.	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc.	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
WC-31	Sylvan Beach					Yes		Yes												
WC-32	Seahurst					Yes		Yes												
WC-33	Command Point					Yes		Yes												
WC-34	Point Beals					Yes		Yes												
WC-35	Colvos Passage		Yes					No												
WC-36	Quartermaster Harbor					Yes		Yes												
WC-37	Point Dalco					Yes		Yes												
WC-38	Neill Point					Yes		Yes												
WC-40	Redondo					Yes		Yes												
WC-41	Point Defiance					Yes		Yes												
WC-42	Dumas Bay					Yes		Yes												
WC-44	Commencement Bay																			
WC-45	Illahee					Yes		Yes												
WC-46	South tip of Bainbridge Island			Yes																
WC-47	Alki Point south to Point Williams			Yes																
WC-48	Quartermaster Harbor		Yes	Yes																

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7. Logistical Information

The following is not a complete list of logistical resources - for more information please refer to the Northwest Area Contingency Plan (NWACP), Chapter 5000, Logistics.

To submit data for this section, please use Comments/ Corrections/ Suggestions (Appendix C).

7.1. Central Puget Sound Logistical Support

Subject	Name	Characteristics	Contact	Phone #
Command Posts				
See Page 5-22 NWACP				
Communications				
See Pages 5-11 to 5-21				
Summary of Area Resource Equipment				
See Pages 5-102 to 5-132				
Helicopter Support/ Air Support	Auburn Municipal Airport	King County	400 23rd Avenue / Auburn, WA 98002	(253) 931-3026
	Boeing Field / King County International Airport	King County	PO Box 80245 / Seattle, WA 98108	(206) 296-7392 or (206) 296-7380
	Renton Municipal Airport	King County	616 Perimeter Road / Renton, WA 98055	(425) 430-7471
	Tacoma Narrows Airport	Pierce County	1022 26th Avenue NW / Gig Harbor, WA 98335	(253) 853-5844
	Bremerton National Airport	Kitsap County	8850 SW , State Highway 3 / Port Orchard, WA	(360) 674-2381
	Sea-Tac International Airport	King County	Sea-Tac	(206) 433-4645
	Crest Airport	King County	29300 179th Place S / Kent, WA 98042	(253) 631-7100
Tribal Resources	Muckleshoot Indian Tribal Council	King County	39015 172nd SE / Auburn, WA 98002	(253) 939-3311
	Puyallup Tribal Council	Pierce County	2002 E. 28th Street / Tacoma, WA 98404	(253) 597-6200
	Suquamish Tribal Council	Kitsap County	PO Box 498 / Suquamish, WA 98392	(360) 426-4441
	Point No Point Treaty Council	Kitsap County	7999 NE Salish Lane / Kingston, WA 98346	
	Port Gamble Community Council	Kitsap County	PO Box 280 / Kingston, WA 98346	(360) 297-2646

Subject	Name	Characteristics	Contact	Phone #
Fire Department				
	Bellevue Fire Dept.	King County	766 Bellevue Way SE / Bellevue, WA 98004	(425) 452-6892
	Bremerton Fire Dept.	Kitsap County	817 Pacific Ave. / Bremerton, WA 98310	(360) 478-5380
	Chief Tacoma Fire Dept. Hdqtrs.	Pierce County	901 Fawcett / Tacoma, WA 98402	(253)591-5737
	Dupont Fire Dept.	Pierce County	302 Louviers Ave. / Dupont, WA 98327	(253) 964-8414
	Edmonds Fire Dept.	Snohomish County	250 5th Ave. N / Edmonds, WA 98020	(425) 771-0215
	Seattle Fire Dept.	King County	301-2nd Avenue South / Seattle, WA 98104	(206) 386-1400
	King County Fire Dist. # 11	King County	1234 SW 112th / White Center	(206) 243-0330
	King County Fire Dist. #13	King County	10019 SW Bank Rd. / Vashon Island	(206)463-2405
	King County Fire Dist. #16	King County	18030 73rd Ave. NE / Bothell	(425) 486-2784
	King County Fire Dist. #2	King County	151100-8th Ave. SW / Burien	(206) 242-2040
	King County Fire Dist. #20	King County	12617-76th Ave. S / Skyway	(206)772-1430
	King County Fire Dist. #26	King County	2238 S 223rd / Des Moines	(206)878-2210
	King County Fire Federal Way	King County	31617-1st Ave. S / Federal Way	(253)839-6234
	King County Fire Dist. #4	King County	1016 N 175th / Shoreline	(206) 546-5716
	Kirkland Fire Dept.	King County	123-5th Ave. / Kirkland	(425) 828-1143
	Kitsap County Fire & Rescue, Dist. #1	Kitsap County	10955 Silverdale Way NW / Silverdale	(360) 692-2551
	North Kitsap Fire & Rescue	Kitsap County	11171 NE Highway 104 / Kingston	(360) 297-3619
	Kitsap County Fire Dist. #12	Kitsap County	4071 Chico Way NW / Bremerton	(360) 377-4744
	Kitsap County Fire Dist. #14	Kitsap County	7549 NE Twin Spits Road / Hansville	(360) 638-2263
	Central Kitsap Fire & Rescue	Kitsap County	7600 Military Road NE / Bremerton	(360) 692-0880
	Kitsap County Fire Dist. #18	Kitsap County	911 Liberty Lane / Poulsbo	(360) 779-3997
	Kitsap County Fire Dist. #2	Kitsap County	8895 Madison Ave N / Bainbridge Island	(206) 842-7686
	North Kitsap Fire & Rescue	Kitsap County	P.O. Box 41 / Kingston	(360) 297-3619
	Kitsap County Fire Dist. #7	Kitsap County	1974 Fircrest Dr. SE / Port Orchard	(360) 871-2411
	Lynnwood Fire Dept.	Snohomish County	19100 44th Ave. W / Lynnwood	(425) 775-3471
	Tacoma Fire Dept.	Pierce County	2015 54th Ave. E / Tacoma	(253) 922-8424

Subject	Name	Characteristics	Contact	Phone #
Local Support Personnel	Bremerton City Hall (Mayor's Office)	Kitsap County	239 Fourth St / Bremerton	(360) 478-5266
	City of Sea-Tac City Hall	King County	19215-28th Ave. S / Sea-Tac	(206) 241-9100
	Kirkland DEM	King County	123 Fifth Ave.	(425) 828-1283
	Seattle Office of Emergency Services	King County	301 Second Avenue S / Seattle	(206) 296-3830
	Tacoma Director of Emergency Management	Pierce County	420 Fawcett St / Tacoma	(253) 798-7470
	Seattle Police Dept.	King County	610 Third Avenue / Seattle	(206) 583-2111
	Tacoma Police Dept.	Pierce County	930 Tacoma Ave. S / Tacoma	(253) 593-4721
	King County DEM	King County	516 Third Ave. / Seattle	(206) 296-3830
	Kitsap County DEM	Kitsap County	1720 Warren / Bremerton	(360) 337-7119
	Pierce County DEM	Pierce County	930 Tacoma Ave. S / Tacoma	(253) 798-7470
	Pierce County Sheriff	Pierce County	Tacoma	(253) 798-4722
	Snohomish County Sheriff	Snohomish County	3000 Rockefeller / Everett	(425) 388-3414
	Kitsap County Sheriff	Kitsap County	614 Division St. / Port Orchard	(360) 337-7145
Marinas/Port Docks	Point Defiance Ramp	Pierce County	Point Defiance Park / next to Vashon ferry landing / Tacoma	
	Totem Marina	Pierce County	821 Dock St. / Tacoma	
	Olie & Charlie's Marina	Pierce County	Marine View Drive / Tacoma	
	Des Moines Marina	King County	Downtown Des Moines	
	East Gig Harbor access	Pierce County	South end of Randall Dr NW / Gig Harbor	
	Ollala Ramp	Kitsap County	Off Ollala Way/ Port Orchard	
	Armeni Ramp	King County	Next to Seacrest Boat House, off Harbor Ave./ Seattle	
	Sunnyside Ramp	King County	Sunnyside Ave. and N. Northlake Way/ Seattle	
	Meadowdale Marina	Snohomish County	162nd Ave. SW/ Meadowdale	
	Shilshole Ramp	King County	Seaview Ave. /Seattle	
	14th Street Ramp	King County	End of 14th St./ Ballard	
	Port of Edmonds Marina	Snohomish County	South end of Admiral Way/ Edmonds	
	Evergreen Park Boat Ramp	Kitsap County	Evergreen Park/ Bremerton	
	Lion's Field Park & Ramp	Kitsap County	Off Sheridan Road/ Bremerton	
	Illahee State Park Ramp	Kitsap County	Illahee State Park	
	Tracyton Ramp	Kitsap County	Town of Tracyton	
	Brownsville Marina	Kitsap County	Town of Brownsville	
	Silverdale Ramp	Kitsap County	Town of Silverdale	
	Poulsbo Ramp	Kitsap County	Town of Poulsbo	

Subject	Name	Characteristics	Contact	Phone #
Marinas/Port Docks (continued)	Port Orchard Public Ramp	Kitsap County	Town of Port Orchard	
	Eagle Harbor Waterfront Park	Kitsap County	Eagle Harbor/ Bainbridge Island	
	Miller Bay Ramp	Kitsap County	On Miller Bay, near Suquamish	
	Annapolis Public Ramp	Kitsap County	Near Port Orchard	
Housing/Feeding/Response Community Support	Airlift Northwest	King County	6987 Perimeter Road/ Seattle	1-800-426-2430
	Auburn General Hospital	Pierce County	20 Second St NE/ Auburn	(253) 833-7711
	Ballard Community Hospital	King County	NW Market and Barnes/ Seattle	(206)782-2700
	Bremerton Naval Hospital	Kitsap County	Bremerton	(360) 475-4000
	Children's Hospital and Medical Center	King County	4800 Sand Point Way NE/ Seattle	(206) 526-2000
	Evergreen Hospital	King County	12040 NE 128th Street/ Kirkland	(425) 899-1000
	Fifth Avenue Hospital	King County	10560 Fifth Avenue NE/ Seattle	(206) 364-2050
	Group Health Central Hospital	King County	201 16th Avenue E/ Seattle	(206) 326-3000
	Group Health Eastside Hospital	King County	2700 152nd NE/ Redmond	(425) 883-5151
	Harborview Medical Center	King County	325 Ninth Avenue/ Seattle	(206) 731-3000
Fishing Fleets & Affiliated Organizations	Puget Sound Gillnetters Assoc.	King County	Fisherman's Terminal/ Seattle	
Boat Cleaning Capability	Airo Services	Pierce County	4110 East 11th St./ Tacoma	(253)383-4916 24 hr. number
	Foss Environmental	King County	660 West Ewing St./ Seattle	1-800-337-7455 24 hr. number

Appendices

Appendix A: Summary of Protection Techniques

Protection Techniques	Description	Primary Logistical Requirements	Limitations
ONSHORE			
Beach Berms	A berm is constructed along the top of the mid-inter tidal zone from sediments ex-cavated along the downgradient side. The berm should be covered with plastic or geo-textile sheeting to minimize wave erosion.	• Bulldozer/Motor grader -1 • Personnel - equipment operator & 1 worker • Misc. - plastic or geotextile sheeting	• High wave energy • Large tidal range • Strong along shore currents
Geotextiles	A roll of geotextile, plastic sheeting, or other impermeable material is spread along the bottom of the supra-tidal zone & fastened to the underlying logs or stakes placed in the ground.	• Geotextile - 3 m wide rolls • Personnel - 5 • Misc. - stakes or tie-down cord	• Low sloped shoreline • High spring tides • Large storms
Sorbent Barriers	A barrier is constructed by installing two parallel lines of stakes across a channel, fastening wire mesh to the stakes & filling the space between with loose sorbents.	Per 30 meters of barrier • Wire mesh - 70 m x 2 m • Stakes - 20 • Sorbents - 30 m^2 • Personnel - 2 • Misc. - fasteners, support lines, additional stakes, etc.	• Waves > 25 cm • Currents > 0.5 m/s • Tidal range > 2 m
Inlet Dams	A dam is constructed across the channel using local soil or beach sediments to exclude oil from entering channel.	• Loader - 1 • Personnel - equipment operator & 1 worker or several workers w/shovels	• Waves > 25 cm • Tidal range exceeding dam height • Freshwater outflow

NEARSHORE			
Containment Booming	Boom is deployed in a "U" shape in front of the oncoming slick. The ends of the booms are anchored by work boats or drogues. The oil is contained within the "U" & prevented from reaching the shore.	For 150 meters Slick: • Boom - 280 m • Boats - 2 • Personnel - boat crews & 4 boom tenders • Misc. - tow lines, drogues, connectors, etc.	• High winds • Swells > 2 m • Breaking waves > 50 cm • Currents > 1.0 m/s
Exclusion Booming	Boom is deployed across or around sensitive areas & anchored in place. Approaching oil is deflected or contained by boom.	Per 300 meters of Boom • Boats - 1 • Personnel - boat crew & 3 boom tenders • Misc.- 6 anchors, anchor line, buoys, etc.	• Currents > 0.5 m/s • Breaking waves > 50 cm • Water depth > 20 m
Deflection Booming	Boom is deployed from the shoreline away from the approaching slick & anchored or held in place with a work boat. Oil is deflected away from shoreline.	Single Boom, 0.75 m/s knot current • Boom - 60 m • Boats - 1 • Personnel - boat crew + 3 • Misc. - 3 anchors, line, buoys, recovery unit	• Currents > 1.0 m/s • Breaking waves > 50 cm
Diversion Booming	Boom is deployed from the shoreline at an angle towards the approaching slick & anchored or held in place with a work boat. Oil is diverted towards the shoreline for recovery.	Single Boom, 0.75 m/s knot current • Boom - 60 m • boats - 1 • Personnel - boat crew + 3 • Misc. - 3 anchors, line, buoys, recovery unit	• Currents > 1.0 m/s • Breaking waves > 50 cm
Skimming	Self-propelled skimmers work back & forth along the leading edge of a windrow to recover the oil. Booms may be deployed from the front of a skimmer in a "V" configuration to increase sweep width. Portable skimmers are placed within containment booms in the area of heaviest oil concentration.	Self-propelled (None) Towed • Boom - 200 m • Boats - 2 • Personnel - boat crews & 4 boom tenders • Misc. - tow lines, bridles, connectors, etc. Portable • Hoses - 30 m discharge • Oil storage - 2000 liters	• High winds • Swells > 2 m • Breaking waves > 50 cm • Currents > 1.0 m/s

Source is R. Miller of Clean Sound Cooperative.

Appendix B: Original Geographic Response Plan Contributors

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John Komorita, King County
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Washington State Maritime Commission
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Washington Department of Natural Resources
Dave Jamison

Parks and Recreation Commission
Mike Ramsey

Other
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Richard Shafer
Shirley Flies, Puget Sound Alliance
Ken Moser, Puget Soundkeeper

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Appendix C: Geographic Response Plan Comments/Corrections/Suggestions

If you have any questions regarding this document or find any errors, please notify one of the following agencies: or use tear out sheet (page C-3)

- USCG Marine Safety Office Puget Sound, Planning Department
- USCG Marine Safety Office Portland
- Washington Department of Ecology, SPPR program, Preparedness Unit
- Oregon Department of Environmental Quality
- Idaho Emergency Response Commission
- Environmental Protection Agency Region 10

Phone Numbers:

USCG MSO Puget Sound	(206) 217-6213
USCG MSO Portland	(503) 240-9307
Washington DOE	(206) 407-6971
Oregon DEQ	(503) 229-5774
Idaho ERC	(208) 334-3263
EPA	(206) 553-6901

Bulletin Board System (BBS):

USCG MSO Puget Sound	(206) 217-6216
USCG MSO Portland	(503) 240-9308

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USCG MSO Portland	cfriese@pacnorwest.uscg.mil
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Planning Department
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Seattle, WA 98134-1192

Commanding Officer
United States Coast Guard
Planning Department
MSO Portland
6767 North Basin Ave
Portland, OR 97217-3992

Washington Department Of Ecology
SPPR Program
Preparedness Unit
P.O. Box 47600
Olympia, WA 98504-7600

Oregon Department of Environmental Quality
Water Quality Division
811 SW Sixth Avenue
Portland, OR 97204

Office Of The Governor
Idaho Emergency Response Commission
1109 Main
Statehouse
Boise, ID 83720-7000

Environmental Protection Agency
Emergency Response Branch
1200 Sixth Avenue
Seattle, WA 98101

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Geographic Response Plan

Comments/Corrections/Suggestions

Directions:

Fill in your name, address, agency, and phone number. Fill in the blanks regarding the location of information in the plan being commented on. Make comments in the space provided. Add extra sheets as necessary. Fold in thirds so the address label is visible and tape closed (don't staple).

Name: _____ Title:_____ Agency: _____

Address:_____

City: _____ State/Province:_____ Zip/Postal Code: _____

Phone: (____) _____

Page Number: _____

Location on page (chapter, section, paragraph) (e.g. 2.1, paragraph 3): _____

Comments: _____

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Northwest Area Committees
c/o Washington Department of Ecology
Spill Preparedness Unit - GRP Corrections
P.O. Box 47600
Olympia, WA 98504-7600